

Blowtorch

Field of Invention

The present invention relates to a blowtorch.

Background of Invention

Referring to Figure 10, a conventional blowtorch 90 includes a reservoir 96 and a valve. The valve includes a housing 91 and a plunger 94. The housing 91 includes a chamber 97, an inlet 92 and an outlet 93. The chamber 97 includes a conical portion through which the inlet 92 is communicated with the outlet 93. The plunger 94 is installed in the chamber 97 in a movable manner. The plunger 94 includes a conical portion for insertion into the conical portion of the chamber 97. The flow rate of gas is determined by the position of the conical portion of the plunger 94 relative to the conical portion of the chamber 97. It is intended that the communication between the inlet 92 and the outlet 93 be interrupted by means of the conical portion of the plunger 94 when the conical portion of plunger 94 is completely inserted in the conical portion of the chamber 97. To this end, the conical portion of the plunger 94 must be shaped in perfect compliance with the conical portion of the chamber 97. This is however difficult in reality. In case the conical portion of the plunger 94 is not shaped in perfect compliance with the conical portion of the chamber 97, the flow of the gas cannot be completely shut and this is dangerous.

The present invention is therefore intended to obviate or at least alleviate

1 the problems encountered in prior art.

2

3 **Summary of Invention**

4 It is the primary objective of the present invention to provide a blowtorch
5 with a secure valve.

6

7 According to the present invention, a valve is provided for a blowtorch.

8 The valve includes a housing, a switching device and an adjusting device.

9 The housing is connected between a reservoir and a nozzle of the
10 blowtorch. The switching device is provided for switching the valve
11 between a communicating mode and a blocking mode. The adjusting
12 device is provided for adjusting the flow rate of the gas through the valve.

13

14 Other objects, advantages and novel features of the invention will become
15 more apparent from the following detailed description in conjunction
16 with the attached drawings.

17

18 **Brief Description of Drawings**

19 The present invention will be described via detailed illustration of
20 embodiments referring to the drawings.

21

22 Figure 1 is a perspective view of a portion of a blowtorch according to the
23 preferred embodiment of the present invention.

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25 Figure 2 is a top view of the blowtorch of Figure 1.

26

1 Figure 3 is a perspective view of a valve of the blowtorch of Figure 1.

2

3 Figure 4 is an exploded view of the valve of Figure 2 and shows a
4 housing of the valve in a cutaway manner.

5

6 Figure 5 is a cross-sectional view of the blowtorch taken along a line 5-5
7 in Figure 1.

8

9 Figure 6 is similar to Figure 5 but shows the blowtorch in another
10 position.

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12 Figure 7 is another cross-sectional view of the blowtorch of Figure 6.

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14 Figure 8 is similar to Figure 7 but shows the blowtorch in another
15 position.

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17 Figure 9 is another cross-sectional view of the blowtorch of Figure 5.

18

19 Figure 10 is a cross-sectional view of a conventional blowtorch.

20

21 **Detailed Description of Embodiments**

22 Referring to Figures 1 and 2, a blowtorch 1 is shown according to the
23 preferred embodiment of the present invention. The blowtorch 1
24 includes a reservoir 10 for storing gas, a valve 20 for controlling the flow
25 of the gas from the reservoir 10, a nozzle 60 for spraying the gas from the
26 valve 20 and an igniter 50 for igniting the gas sprayed from the nozzle 60.

1 Referring to Figures 3 and 4, the valve 20 includes a housing 21, a
2 switching device for switching the valve 20 between a communicating
3 mode and a blocking mode and an adjusting device for adjusting the flow
4 rate of the gas through the valve 20.

5
6 The housing 21 includes an inlet 22 communicated with the reservoir 10,
7 a first chamber 26 communicated with the inlet 22, a channel 27
8 communicated with the first chamber 26, a second chamber 25
9 communicated with the channel 27 and an outlet 28 communicated with
10 the second chamber 25. The first chamber 26 includes a wide portion 29
11 and a narrow portion 30, thus forming an annular shoulder 31 between
12 the wide portion 29 and the narrow portion 30. The inlet 22 leads to the
13 large portion 29 of the first chamber 26. From the narrow portion 30 of
14 the first chamber 26 leads the channel 27. A thread (not numbered) is
15 formed on the wall of the large portion 29 of the first chamber 26. As
16 shown in Figures 7-9, a thread 54 is formed on the wall of the second
17 chamber 25.

18
19 The switching device includes a plunger 23, a spring 32, an annular seal
20 33, a cap 34, a pusher 24 and a spring 39. The plunger 23 includes a
21 wide portion 35 and a narrow portion 36 extending from the wide portion
22 35. The narrow portion 36 of the plunger 23 includes a first annular
23 groove (not numbered) and a second annular groove 37. An annular seal
24 38 is put around the narrow portion 36 of the plunger 23, with an internal
25 edge thereof put in the first annular groove.

1 Referring to Figure 5, the narrow portion 36 of the plunger 23 is inserted
2 through the narrow portion 30 of the first chamber 26 while the wide
3 portion 35 of the plunger 23 is put into the wide portion 29 of the first
4 chamber 26. The spring 32 is put in the wide portion 29 of the first
5 chamber 26. The annular seal 33 is put on the housing 21. The cap 34
6 is secured to the housing 21, thus retaining the plunger 23, the spring 32
7 and the annular seal 33. To this end, the cap 34 includes a thread (not
8 numbered) engaged with the thread formed on the wall of the wide
9 portion 29 of the first chamber 26.

10

11 A pusher 24 is provided in order to push the narrow portion 36 of the
12 plunger 23. The pusher 24 is put next to the housing 21 and movable
13 relative to the narrow portion 36 of the plunger 23 between the position
14 shown in Figure 5 and a position shown in Figure 6. The pusher 24
15 includes a first end 51, a second end 52 and an inclined portion 53 formed
16 between the first end 51 and the second end 52. The first end 51 of the
17 pusher 24 is reduced in size. The second end 52 of the pusher 24 is
18 formed as a plate.

19

20 The spring 39 is compressed between the inclined portion 53 of the
21 pusher 24 and a portion of the housing 21. The first end 51 of the
22 pusher 24 is inserted in the spring 39.

23

24 In the position shown in Figure 5, the inclined pusher 24 does not contact
25 the narrow portion of the plunger 23. The annular seal 38 is forced
26 against the annular shoulder 31 by means of the spring 32 so as to block

1 the communication between the wide portion 29 and the narrow portion
2 30 of the first chamber 26. The valve 20 is in the blocking mode.

3

4 In the position shown in Figure 6, the pusher 24 is moved to the right so
5 that the inclined portion 53 of the pusher 24 pushes the narrow portion 36
6 of the plunger 23. The annular seal 38 is moved from the annular
7 shoulder 31 so as to allow the communication between the wide portion
8 29 and the narrow portion 30 of the first chamber 26. The valve 20 is in
9 the communicating mode.

10

11 Referring to Figure 4, the adjusting device includes a plunger 45 and a
12 driver 41. The plunger 45 includes a conical end 46 and a round end 47.
13 The driver 41 includes a recessed end 48 and a thread 49 formed thereon.
14 The round end 47 of the plunger 45 is put in the recessed end 48 of the
15 driver 41 like a ball-and-socket device. Hence, disengagement of the
16 round end 47 of the plunger 45 from the recessed end 48 of the driver 41
17 is prevented while rotation of the round end 47 of the plunger 45 in the
18 recessed end 48 of the driver 41 is allowed.

19

20 Referring to Figure 7, the plunger 45 and the driver 41 are driven into the
21 second chamber 25 by means of rotating the driver 41 relative to the
22 housing 21 as the thread 49 is engaged with the thread 54. The conical
23 end 46 of the plunger 45 is aligned with the outlet 28.

24

25 Referring to Figure 8, via rotating the driver 41 relative to the housing 21,
26 the conical end 46 of the plunger 45 is moved into the outlet 28. The

1 outlet 28 is partially shut. Thus, the flow rate of the gas through the
2 valve 20 is tuned down.

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4 Referring to Figure 9, via rotating the driver 41 relative to the housing 21,
5 the conical end 46 of the plunger 45 is further moved into the outlet 28.
6 Thus, the flow rate of the gas through the valve 20 is further tuned down.

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8 The plunger 45 and the driver 41 are made separately and connected with
9 each other so that relative rotation of each other is allowed. Thus, in
10 case the second chamber 25 is not aligned perfectly with the outlet 28, or
11 in the case the conical end 46 of the plunger 45 is not made perfectly
12 compliant with the outlet 28, the plunger 45 automatically rotates relative
13 to the driver 41 to ensure the conical end 46 thereof adequately seal the
14 outlet 28.

15

16 A handle device 40 is provided for driving the pushers 24 and 41. The
17 handle device 40 includes an external button 43 and an internal button 44
18 for driving the pusher 24. The handle device 40 includes a knob 43 for
19 driving the driver 41. The handle device 40 will not be described in
20 detail for not being the spirit of the present invention.

21

22 The present invention has been described via detailed illustration of some
23 embodiments. Those skilled in the art can derive variations from the
24 embodiments without departing from the scope of the present invention.
25 Therefore, the embodiments shall not limit the scope of the present
26 invention defined in the claims.